Monitoring for PCBs: a matter of detection

- 209 distinct PCB Compounds – "Congeners"
- Total PCB (tPCB) = Summation of 209 Congeners *(Basis for VA WQC* = 1,700 pg/L*)*
- Aroclors – a subset of congeners.
  - Aroclor 1248 is 48% chlorine
- Dielectric oils (transformer fluids) considered non PCB if < 50 ppm
  - Fish advisories at 0.05 ppm

- EPA Analytical Methods for PCBs (40 CFR Part 136)
- Method 608 and Method 625 – target Aroclors
  - Method 608
    - Permit reporting level = 500,000 – 1,000,000 pg/L
    - Detection level = 65,000 pg/L
  - Method 625
    - Reporting level = 50,000,000 pg/L
- TMDL and source tracking problem
  - Lacking ambient water and effluent PCB data at concentrations relevant to the WQC
  - Data deficiency require assumptions regarding loadings; or
- Solution
  - Utilize a method that can measure low level PCBs

- EPA Method 1668, Revision A
  - Non-Promulgated, performance based method
  - High Resolution GC/High Resolution MS
- Measures Total PCB - Congener-specific basis
  - Detection Level 5 pg/L (or 0.000005 ug/L)
  - Reporting Level 8-12 pg/L
- Used by DRBC for Delaware River TMDL
- Used for the Potomac River TMDL
- Currently being used for the Roanoke (Staunton) River and Levisa Fork TMDLs
- Allows for detection of PCB levels un-detectable by former test methods.

Prefix	Symbol	Multiplier	
exa	E	10^{18}	1,000,000,000,000,000,000
peta	P	10^{15}	1,000,000,000,000,000
tera	T	10^{12}	1,000,000,000,000
giga	G	10^{9}	1,000,000,000
mega	M	10^{6}	1,000,000
kilo	k	10^{3}	1,000
hecto	h	10^{2}	100
deka	da	10^{1}	10
deci	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	μ	10^{-6}	0.000,001
nano	n	10^{-9}	0.000,000,001
pico micro micro	p $\mu\mu$	10^{-12}	0.000,000,000,001
femto	f	10^{-15}	0.000,000,000,000,001
atto	a	10^{-18}	0.000,000,000,000,000,001